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March 3, 2009

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RE: Dissolved Phase Investigation Work Plan– March 2009
The Hartford Area Hydrocarbon Plume Site/Hartford, Illinois
ILR000128249 – Madison County – LPC 1190505040
URS Project No. 215612129

Dear Messrs. Turner and Faryan:

URS Corporation (URS), on behalf of the Hartford Working Group (HWG) is submitting this Dissolved Phase Investigation Work Plan. This Work Plan is based on the recommendations from Clayton's (2006) *Dissolved Phase Groundwater Investigation Report*, the *Response to Agency Technical Review Comments on the Dissolved Phase Groundwater Investigation Report* letter, dated November 3, 2006, and the conference call with USEPA and IEPA on May 16, 2007.

Please contact me with any questions.

Very truly yours,

Steven J. Shroff
Project Manager

Encl.: Dissolved Phase Investigation Work Plan– March 2009

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Messrs. Turner and Faryan
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Page 2

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WORK PLAN

DISSOLVED PHASE INVESTIGATION WORK PLAN

**1190505040 – Madison County – ILR000128249
The Hartford Area Hydrocarbon Plume Site
Hartford, Illinois**

Prepared for
Hartford Working Group
Hartford, Illinois

March 2009



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TABLE OF CONTENTS

SECTION 1	INTRODUCTION.....	1-1
SECTION 2	PREVIOUS INVESTIGATIONS.....	2-1
SECTION 3	SCOPE OF WORK	3-1
SECTION 4	REFERENCES.....	4-1

List of Tables

Table 1	List of Monitoring Wells Gauged on a Quarterly Basis
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List of Figures

Figure 1	Village of Hartford, IL and Surrounding Area Map
Figure 2	Site Features Map
Figure 3	Sample Locations

SECTION ONE

Introduction

This Dissolved Phase Investigation Work Plan was prepared for The Hartford Area Hydrocarbon Plume Site (Site) in Hartford, Illinois (Figure 1). This Work Plan was prepared by URS Corporation (URS), on behalf of the Hartford Working Group (HWG) to meet the requirements of Paragraph 51 of the Administrative Order on Consent (AOC) with the United States Environmental Protection Agency (USEPA) in the matter of The Hartford Area Hydrocarbon Plume Site (Site) (Docket No. R7003-5-04-001) (USEPA, undated). The HWG is comprised of the Atlantic Richfield Company (Atlantic Richfield), The Premcor Refining Group Inc. (Premcor), and Shell Oil Products US (Shell).

This Work Plan is based on the recommendations from Clayton's (2006) *Dissolved Phase Groundwater Investigation Report*, the *Response to Agency Technical Review Comments on the Dissolved Phase Groundwater Investigation Report* letter, dated November 3, 2006, and the conference call with USEPA and IEPA on May 16, 2007.

This investigation is designed to supplement the understanding of the dissolved phase groundwater plume.

SECTION TWO

Previous Investigations

Dissolved Phase Groundwater Investigation Report (2006)

On behalf of the HWG in 2005, Clayton conducted a dissolved phase groundwater investigation and documented the field activities and conclusions in Clayton's (2006) *Dissolved Phase Groundwater Investigation Report*. The conclusions include:

The area of the Hartford Municipal Wells has not been impacted by the LNAPL based on the followings points:

- Regional groundwater flow in the Main Sand has consistently been northerly (away from the Hartford municipal wells) based on a review of both historical and recent flow mapping data.
- Sentinel wells have shown no indications of impact from the existing LNAPL and associated dissolved phase hydrocarbon plume since their installation in December 2003.
- The ROST investigation showed no indications of LNAPL in the vicinity of the Hartford municipal wells.
- The groundwater screening investigation in the vicinity of the Hartford municipal wells showed no indications of dissolved phase hydrocarbons.
- Groundwater flow mapping in the vicinity of the Hartford municipal wells does not indicate any pumping influence by the municipal wells beyond the immediate area of their location.

The extent of the dissolved phase hydrocarbon plume has been defined within the available area of investigation. The following findings are consistent with groundwater flow in the Main Sand which, based on a review of both historical and recent flow mapping data, has consistently been northerly:

- The groundwater screening investigation along the southern boundary of the interpreted extent of the ROST response showed no indications of dissolved phase hydrocarbons.
- The groundwater screening investigation along southern portions of the western boundary of the interpreted extent of the ROST response did not indicate the presence dissolved phase hydrocarbons above applicable TACO Tier 1 GROs for Class I groundwater (groundwater comparison values (CVs)).

SECTION TWO

Previous Investigations

- The groundwater screening investigation and monitoring well sampling results show that dissolved constituents above CVs to the south and portions of the west are largely limited to areas of residual LNAPL (which has been reasonably defined with the ROST) with concentrations rapidly falling off beyond the area of residual LNAPL.
- The groundwater screening investigation along northern portions of the western boundary of the interpreted extent of the ROST response indicated the presence of dissolved phase hydrocarbons above applicable groundwater CVs.
- The groundwater screening investigation along the northern and eastern boundaries of the Site indicated the presence of dissolved phase hydrocarbon concentrations above applicable groundwater CVs.
- The groundwater screening investigation revealed that the highest concentrations of MTBE are found north of Rand Avenue.

Based on current conditions and the long-term existence of the LNAPL at the Site, the dissolved phase plume is expected to continue to form a narrow “halo” around the southern and the majority of the western portions of the LNAPL with similar dissolved phase conditions anticipated along the remaining LNAPL boundaries.

Quarterly Groundwater Monitoring

Quarterly groundwater sampling of existing wells (that do not contain LNAPL) within the four hydrostratigraphic units in Hartford has been on-going since December 2003. As wells have been installed as part of investigative activities from 2004 through 2006, they have been incorporated into the quarterly monitoring program. As proposed in the *Dissolved Phase Groundwater Investigation Report* (Clayton, 2006), a select number of monitoring wells continue to be sampled and analyzed on a quarterly basis to monitor conditions along the perimeter of the dissolved phase plume. An additional select number of monitoring wells are sampled and analyzed on an annual basis. The quarterly sampling includes selected wells screened in the Rand, EPA and Main Sand Strata, located beyond the interpreted extent of free product. The annual sampling includes selected wells, if free of LNAPL, throughout northern Hartford. Wells in the North Olive Stratum are included in the both the quarterly and annual groundwater-sampling programs; however, as water in this unit is seasonal or ephemeral and occurs as isolated areas of perched water, groundwater is typically not present during sampling events. The well locations are shown in Figure 2.

SECTION TWO

Previous Investigations

The following conclusions from the October 2008 Quarterly Groundwater Sampling Report are consistent with historical findings and groundwater flow in the Main Sand, which, based on a review of both historical and October 2008 flow mapping data, has consistently been northerly:

- The groundwater analytical results along the southern and western boundaries of the interpreted extent of the ROST response did not indicate the presence of dissolved phase hydrocarbons.
- The groundwater analytical results along the northern and eastern boundaries of the Site indicated the presence of dissolved phase hydrocarbon concentrations above applicable groundwater CVs.
- The sentinel wells have not been impacted by the LNAPL underlying northern Hartford. Neither BTEX nor MTBE constituents were detected at quantifiable concentrations or detected above applicable TACO Tier 1 GROs for Class I groundwater. The conclusion is also based on the groundwater flow mapping of the Main Sand, which shows flow in the area of the LNAPL plume in northern Hartford is to the northeast or northwest depending on river stage elevation, away from the Hartford Well Head Protection Area (WHPA) and the Hartford municipal water supply wells.

SECTION THREE

Scope of Work

Recommendations for continued groundwater monitoring from Claytons' 2006 *Dissolved Phase Groundwater Investigation Report* include the following:

- Installation of nested monitoring wells south of the LNAPL to further assess groundwater flow in the deep Main Sand and potential vertical flow gradients, in the relative vicinity of the Hartford municipal wells.
- Installation of nested monitoring wells at selected areas bounding the LNAPL to further assess groundwater quality and flow, both horizontally and vertically, in northern Hartford.
- Gauging of selected monitoring wells on a quarterly basis (Table 1), including the new nested monitoring wells, to monitor groundwater flow in the more permeable units (Rand, EPA and Main Sand Strata).
- Groundwater sampling and analyses of selected monitoring wells (without LNAPL) on a quarterly basis, including the new nested wells, to monitor the dissolved phase hydrocarbon plume in Hartford.

Nested Monitoring Well Installation South of LNAPL Area

Additional monitoring well locations (Figure 3) were determined on the basis of groundwater hydropunch results which indicated the presence of dissolved phase, petroleum-related (BTEX) constituents above groundwater CVs in the Main Sand Stratum, at a depth of approximately 70 feet bgs on South Olive Street (HROST-119) and at a depth of approximately 34 feet bgs on South Olive Street (HROST-57). Both HROST-57 and HROST-119 are considered to be upgradient of, and unrelated to, the LNAPL at the Site. This is based on groundwater flow patterns (generally to the north – northeast in this area) and the absence of BTEX constituents in groundwater samples collected between HROST-119 and the LNAPL in northern Hartford at HROST-110 and HROST-111 (located between East Maple and East Hawthorne Streets). While BTEX was detected in one of the groundwater screening samples collected at HROST-112 (which is located due east of HROST-111), no benzene was detected at this location and the total BTEX concentration at HROST-112 (20.7 µg/L) is two orders of magnitude less than the total BTEX concentration at HROST-119 (1,301 µg/L). Furthermore, sentinel well HMW-29, which is located approximately 270 feet to the west-southwest of HROST-57, is screened over the same interval sampled at HROST-57 and no detectable BTEX concentrations associated with the LNAPL have been identified there since groundwater sampling began in December 2003.

SECTION THREE

Scope of Work

To better understand groundwater flow, in the vicinity of HROST-57 and HROST-119, a nested monitoring well (HWM-57A,B) is proposed to be installed on East Second Street (Figure 3). In this area, the nested monitoring wells will help improve the understanding of vertical flow between the shallow and deep Main Sand, as well as general flow within the deep Main Sand. In addition, these wells will help improve the understanding of the apparent groundwater divide created in the east central portion of Hartford by pumping on the Premcor facility. HMW-57A will be installed to straddle the water table with a screen interval from approximately 25 to 40 feet bgs and HMW-57B will be installed to screen the deeper portion of the Main Sand from approximately 65 to 70 feet bgs.

Nested Monitoring Well Installation

Groundwater screening has also indicated the presence of dissolved phase, petroleum-related (BTEX) constituents above groundwater CVs in the Main Sand Stratum, at depth, along the leading edge of the dissolved phase plume to the northwest. As indicated above, additional activities will be required to address this portion of the dissolved phase groundwater plume. To enable a more complete understanding of potential groundwater impacts, especially at depth within the Main Sand, two new well nests (HMW-55 and HMW-56) are proposed to be installed along the levee and Illinois Route 3 corridor, west of West Arbor and West Cherry Streets, respectively (Figure 3). At these locations, a monitoring well will be placed in each interpreted permeable strata. Only the Rand Stratum and the Main Sand are expected to be encountered at HMW-55. Therefore, at HMW-55, it is anticipated that the Rand Stratum will be screened from approximately 16 to 20 feet bgs and the Main Sand will be screened at 3 discrete depths. At HMW-56, the North Olive Stratum, the Rand Stratum, and the Main Sand are expected to be encountered. Therefore at HMW-56, it is anticipated that the North Olive Stratum will be screened from approximately 10 to 12 feet bgs, the Rand Stratum will be screened from approximately 15 to 26 feet bgs, and the Main Sand Stratum will be screened at 3 discrete depths.

The three discrete depths within the Main Sand Stratum that will be screened at both HMW-55 and HMW-56 are 1) from approximately 25 to 35 feet bgs (across the water table or up to the base of the overlying confining unit), 2) from approximately 45 to 50 feet bgs (depth at which constituents were detected above CVs during groundwater screening investigation), and 3) from approximately 65 to 70 feet bgs (approximate greatest depth at which constituents were detected during the groundwater screening investigation).

SECTION THREE

Scope of Work

In order to enhance the spatial distribution of the existing monitoring network to evaluate groundwater flow and the magnitude of groundwater impacts within the deeper portion of the Main Sand in the northeastern portion of Hartford, an additional monitoring well will be installed at existing monitoring well location HMW-48 located on North Olive Street, just south of Rand Avenue (Figure 3). At HMW-48, wells are already screen in the North Olive, Rand, EPA, and top of the Main Sand Strata. Therefore, an additional deep monitoring well will be installed in the Main Sand and screened from approximately 65 to 70 feet bgs.

Installation Procedures

Both unconfined (water table) and confined (piezometric surface) conditions are anticipated in the Main Sand Aquifer at the proposed locations. The nested monitoring wells are anticipated to be installed using a conventional hollow-stem auger or rotosonic drill rig. The shallowest monitoring well in the Main Sand will generally straddle the identified water table or be screened up to the base of the overlying confining unit, depending on conditions at the time of installation. These locations will be nested to enable evaluation of groundwater conditions at depth within the Main Sand along with both horizontal and vertical gradients.

All new monitoring wells are proposed to be constructed of 2-inch ID polyvinyl chloride (PVC) with 0.010-inch slotted screens. As these monitoring wells are intended to evaluate groundwater elevation conditions that may vary by 10 feet or more over the course of the year, the screen length of the shallow monitoring wells will be approximately 10 to 15 feet to minimize the potential of dry monitoring wells. As the deeper monitoring wells are intended to provide vertical gradient data, the screen lengths of these will be approximately five feet to minimize the influence of vertical groundwater gradients. The general SOP for well installation is as follows:

- 1) A #1 sand filter pack will be placed around the screen and extend a maximum of six inches below the bottom of the screen and extending to the top of the screen. Five gallons of water will be added (if no water is present) after each foot of sand pack is placed. The sand pack will then be surged with a surge block for ~20-30 minutes. After surging, 1-foot of a #00 sand filter pack will be placed above the #1 filter pack.
- 2) A minimum three-foot thick bentonite-pellet seal will be placed above the sand pack. Each foot of seal will be allowed to hydrate for ~20-30 minutes after the addition of the appropriate amount of water.

SECTION THREE

Scope of Work

- 3) A cement-bentonite grout mixture will then be placed from the top of the bentonite seal to approximately two feet below the ground surface.
- 4) The surface completion will include installation of a locking cap and a flush mount well cover.

This may be modified based on field conditions. Actual screened depths will be determined in the field after the soil boring logs have been reviewed. The intent is to screen the more permeable zones of the Main Sand.

Each new well will be surveyed by an Illinois-licensed surveyor for horizontal control referenced to Illinois State Plane West Zone NAD 83 (feet) and vertical control referenced to mean sea level (feet). This survey will enhance the horizontally and vertically controlled unified database of existing wells within Hartford.

CPT/ROST and Multi-Level Groundwater Investigation

During the Dissolved Phase Groundwater Investigation in 2005, railroad access agreements necessary for completion of the investigation were not acquired. Therefore, to enhance the understanding of the Site subsurface along the railroad corridor east of North Olive Street, the seven remaining cone-penetration testing/ Rapid Optical Screening Tool (CPT/ROST) locations and the six remaining discrete groundwater sampling collected from six of the seven CPT/ROST locations will be completed as originally proposed in the May 24, 2005 *Dissolved Phase Groundwater Investigation Work Plan*. This includes analysis of approximately 35 discrete groundwater samples for BTEX and MTBE. The sampling locations are presented on Figure 3 and include HROST-86, HROST-95, HROST-100, HROST-102, HROST-105, HROST-108, and HROST-127. HROST-105 and HROST-127 will be installed in areas of known LNAPL. Groundwater samples will not be collected from HROST-127. At HROST-105, the strata above the Main Sand will be sampled at this location if groundwater is present, however; no groundwater samples will be collected within the Main Sand at LNAPL-containing boring locations to avoid potential cross-contamination from the overlying LNAPL during advancement of sampling equipment.

SECTION THREE

Scope of Work

CPT/ROST

The initial activities will consist of assessing the geology using CPT. To further enhance the previous LNAPL investigation conducted by Clayton in 2004, the ROST technology will be employed concurrently with the CPT to identify any residual petroleum hydrocarbons at the proposed locations. The ROST technology will be applied over the entire vertical extent of the boring. Subsequent activities will consist of discrete, multi-level groundwater sampling and chemical analysis of the samples at each of the CPT/ROST locations.

The CPT borings will be advanced to the depth limits of the rig (which ranged from 50 to 86 feet during the Dissolved Phase Groundwater Investigation in 2005) to obtain geologic data. The upper 10 feet at each boring location will be hand-augered to identify potential subsurface utilities prior to all drilling activities. CPT is a technique in which an electronically instrumented probe (in this case a piezocone probe) is advanced into the subsurface media using hydraulic rams mounted inside the CPT box truck. The piezocone probe contains gauges that continuously monitor tip resistance, friction ratio, and pore pressure. Tip resistance and friction ratio are used to determine the soil stratigraphy while pore pressure is used as an indicator of soil moisture. This data is plotted onto a log. Soil stratigraphy is then classified using Campanella and Robertson's Simplified Soil Behavior Chart (Robertson and Campanella, 1983).

Decontamination will be conducted adjacent to each boring location and no soil cuttings will be produced during the testing. The boring locations will be sealed upon completion with bentonite.

The ROST™ portion of the investigation will be completed concurrently with the CPT activities to obtain screening data on the potential in-situ distribution of petroleum hydrocarbons in the soil matrix throughout the vadose, capillary fringe, and saturated zones at the boring locations. The technology consists of a tunable laser, mounted in the truck, which is connected by optical fibers to a down-hole sensor flush with the side of the piezocone probe. The laser creates a fluorescence response in polycyclic aromatic hydrocarbons (PAH) and some aromatic petroleum compounds as the probe is advanced. A portion of the fluorescence emitted is returned through the sensor to a detection system in the truck. The ROST data are continuously recorded. A proprietary petroleum hydrocarbon compound (PHC) containing reference solution is used for ROST calibration purposes.

Any emitted fluorescence is measured simultaneously at each of four monitoring wavelengths that cover the range of fluorescence produced, from light-range (shorter wavelength) to heavy-

SECTION THREE

Scope of Work

range (longer wavelength) petroleum hydrocarbons. The relative percentage of fluorescence at each of the four wavelengths is continuously measured. The results from the monitored wavelengths are combined, based on the relative fluorescence intensity percentages of each of the four wavelengths, and plotted on the ROST log. The emitted fluorescence of the four wavelengths is totaled and recorded as the fluorescence intensity (% RE). The ROST data are presented as a color graph of fluorescence intensity (% RE) versus depth (feet). The ROST data are subject to spectral interference including naturally occurring fluorescent minerals.

Multi-Level Groundwater Sampling

The groundwater investigation will consist of six direct push multi-level groundwater samples collected from the CPT/ROST locations, completed to determine the magnitude and extent of the dissolved phase hydrocarbons at the locations. The investigation area is primarily northwest of the existing LNAPL underlying the Site. The proposed groundwater investigation locations are presented in Figure 3. Locations will be adjusted based on accessibility, clearances for utilities, and other field conditions.

The multi-level sampling will be conducted in accordance with the 2005 Dissolved Phase Investigation. The discrete multi-level sampling of any location will be dependent upon the findings of the subsurface investigation. Specifically, if the more permeable units (the North Olive, the Rand, the EPA and the Main Sand Strata) are encountered and determined to be saturated, but do not have a ROST response indicative of the presence of significant amounts of LNAPL, samples will be obtained to identify potential dissolved phase hydrocarbons within each strata. In addition, discrete vertical sampling will continue within the Main Sand to determine whether dissolved phase hydrocarbons are present at depth within this stratum. The initial sampling depth within the Main Sand will be at the surface of the saturated zone, which is expected to be approximately 30 feet bgs. Deeper Main Sand samples will be typically collected between 40 to 50 feet bgs, 50 to 60 feet bgs, and at the maximum depth achievable by the equipment. The Main Sand sampling depths will be guided by the findings of the investigation. Specifically, if distinctly more permeable or coarser zones are identified in the Main Sand, the groundwater sampling will be biased to these depths. However, this approach will be balanced by the need to obtain sufficient vertically distinct samples to identify whether dissolved phase hydrocarbons may be transported at depths below the LNAPL identified in the Main Sand.

SECTION THREE

Scope of Work

The vertically discrete groundwater samples will be collected using the CPT rig equipped with a Hydropunch (direct-push instrument). This technique involves pushing rods, which include a shielded, approximately 1.5-foot stainless steel screen attached to their ends, to the target depth. Once at the target depth, the shield is pulled back exposing the screen. Groundwater flows into the rods through the screen and tubing is lowered through the rod to retrieve the water sample.

Depending upon conditions, the number of vertically discrete groundwater samples should range from two to four at each of the sampled boring locations. In addition, quality control samples will be collected. The samples will be submitted to Teklab, Inc. for analysis. The groundwater samples and quality control samples will be analyzed for the dissolved phase hydrocarbon indicator parameters BTEX and methyl-tert-butyl-ether (MTBE). The BTEX and MTBE analysis will be performed in accordance with USEPA SW-846 Method 5030/8260B.

Decontamination activities for the groundwater sampling equipment will be conducted on secured Hartford property that had been prepared to serve as a temporary waste storage, and decontamination yard for the planned work. The boring locations will sealed upon completion with bentonite.

SECTION FOUR

References

- Bureau Veritas North America, Inc., June 22, 2007. *Quarterly Groundwater Monitoring Report, April 2007, The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois.*
- Bureau Veritas North America, Inc., June 15, 2007. *Sentinel Wells Quarterly Groundwater Monitoring Report, April 2007, The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois.*
- Clayton Group Services, Inc., May 24, 2005. *Dissolved Phase Groundwater Investigation Work Plan, The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois.*
- Clayton Group Services, Inc., December 15, 2005. *LNAPL Active Recovery System Conceptual Site Model, The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois.*
- Clayton Group Services, Inc., January 4, 2006. *Dissolved Phase Groundwater Investigation Report for The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois.*
- Illinois Pollution Control Board, 1997. *Tiered Approach to Corrective Action Objectives: 35 IAC Part 742.* Adopted rule, Final Order June 5, 1997. Last amended February 15, 2007.
- United States Environmental Protection Agency, Region 5, Chicago, Illinois. *In the Matter of the Hartford Area Hydrocarbon Plume Site.* (Docket No. R7003-5-04-001).
- URS Corporation, January 15, 2009. *October 2008 Quarterly Groundwater Monitoring Report (Including Sentinel Wells), The Hartford Area Hydrocarbon Plume Site, Hartford, Illinois*

TABLE 1

List of Monitoring Wells Gauged on a Quarterly Basis

The Hartford Area Hydrocarbon Plume Site

1190505040 -- Madison County -- ILR 000128249

The Hartford Working Group / Hartford, IL

Well	Stratum Screened
HB-16	Main
HB-30	Main
HB-31	Main
HB-32	Main
HB-33	Rand / C Clay / EPA / D Clay / Main Sand
HB-37	Main
HB-38	Main
HMW-01	Rand
HMW-02	Main
HMW-03	EPA
HMW-04	Rand
HMW-07	Rand
HMW-08	Main
HMW-09	N. Olive / B Clay / Rand
HMW-10	Main
HMW-13	North Olive
HMW-14	Rand / C Clay / Main Sand
HMW-18	Main
HMW-19	Main
HMW-20	Rand / C Clay / Main Sand
HMW-21	N. Olive / B Clay / Rand
HMW-22	Main
HMW-25	Main
HMW-26	Main
HMW-27	Main
HMW-28	Main
HMW-29	Main
HMW-30	Rand / C Clay / Main Sand
HMW-31	Rand / C Clay / Main Sand
HMW-32	Rand / C Clay / Main Sand
HMW-33	Rand / C Clay / Main Sand
HMW-34	Rand / C Clay / Main Sand
HMW-35	Rand / C Clay / Main Sand
HMW-36	Rand / C Clay / Main Sand
HMW-37	Rand / C Clay / Main Sand
HMW-38A	North Olive
HMW-38B	B/C Clay (PL in B/C Clay)
HMW-38C	Main
HMW-39A	Main Silt (Rand Horizon)
HMW-39B	Main Silt (Rand Horizon)
HMW-39C	Main
HMW-40A	A Clay
HMW-40B	Main
HMW-40C	Main
HMW-41A	Main Silt (Rand Horizon)
HMW-41B	Main Silt (Rand Horizon)
HMW-41C	Main
HMW-42A	Main Silt (Rand Horizon)
HMW-42B	Main
HMW-43A	North Olive
HMW-43B	B/C Clay (PL in B/C Clay)
HMW-43C	Main
HMW-44A	North Olive
HMW-44B	Rand
HMW-44C	Main
HMW-44D	Main
HMW-45A	North Olive
HMW-45B	Rand
HMW-45C	Main
HMW-46A	North Olive
HMW-46B	B/C Clay (PL in B/C Clay)
HMW-46C	Main
HMW-47A	North Olive
HMW-47B	B/C Clay (PL in B/C Clay)
HMW-47C	Main
HMW-48A	North Olive
HMW-48B	Rand
HMW-48C	EPA
HMW-48D	Main
HMW-49A	North Olive
HMW-49B	B/C Clay (PL in B/C Clay)
HMW-49C	EPA
HMW-49D	Main
HMW-50A	Rand

TABLE 1

List of Monitoring Wells Gauged on a Quarterly Basis

The Hartford Area Hydrocarbon Plume Site

1190505040 -- Madison County -- ILR 000128249

The Hartford Working Group / Hartford, IL

Well	Stratum Screened
HMW-50B	EPA
HMW-50C	Main
HMW-51A	North Olive
HMW-51B	Main
HMW-51C	Main
HMW-52A	Main Silt (N. Olive Horizon)
HMW-52B	Main Silt (Rand Horizon)
HMW-52C	Main
HMW-53A	North Olive
HMW-53B	Main Silt (Rand Horizon) / Main Sand
HMW-53C	Main
HMW-54A	North Olive
HMW-54B	Main
HMW-54C	Main
HP-01A	Main
HP-01B	Main
HP-01C	Main
HP-02	Main
HP-03A	Main
HP-03B	Main
HP-03C	Main
HP-04A	Main
HP-04B	Main
HP-04C	Main
HP-05A	Main
HP-05B	Main
HP-05C	Main
HP-06	Main
HP-07	Main
HP-08	Main
HP-09	Main
IEPA-04	Main
MP-05D	Rand
MP-05S	A Clay
MP-06D	Rand
MP-06S	A Clay
MP-07D	Rand
MP-07S	A Clay
MP-08D	Rand
MP-08S	A Clay
MP-09D	Rand
MP-09S	A Clay
MP-10D	B/C Clay / Main Silt (Rand Horizon)
MP-10S	A Clay
MP-11D	B/C Clay / Main Silt (Rand Horizon)
MP-11S	A Clay
MP-12D	B Clay / Rand / C Clay
MP-12S	A Clay
MP-13D	Main Silt (Rand Horizon)
MP-13S	A Clay
MP-14D	Main Silt (Rand Horizon)
MP-14S	A Clay
MP-15D	Main Silt (Rand Horizon)
MP-15S	A Clay
MP-16D	Main Silt (Rand Horizon)
MP-16S	A Clay
MP-25	N. Olive / B Clay / Rand
MP-26	N. Olive / B Clay / Rand
MP-27	N. Olive / B Clay / Rand
MP-28	Rand
MP-29A	North Olive
MP-29B	Rand
MP-29C	Rand
MP-29D	Main
MP-30A	North Olive
MP-30B	Rand
MP-30C	Main
MP-31A	A Clay
MP-31B	North Olive
MP-31C	Main
MP-32A	North Olive
MP-32B	Main
MP-32C	Main
MP-33A	A Clay
MP-33B	North Olive

TABLE 1

List of Monitoring Wells Gauged on a Quarterly Basis

The Hartford Area Hydrocarbon Plume Site

1190505040 -- Madison County -- ILR 000128249

The Hartford Working Group / Hartford, IL

Well	Stratum Screened
MP-33C	Rand
MP-33D	Main
MP-34A	North Olive
MP-34B	Rand
MP-34C	Main
MP-35A	A Clay
MP-35B	North Olive
MP-35C	Rand
MP-35D	Main
MP-36A	North Olive
MP-36B	Rand
MP-36C	Main
MP-37A	North Olive
MP-37B	Rand
MP-37C	C Clay
MP-37D	Main
MP-38A	North Olive
MP-38B	Main Silt (Rand Horizon)
MP-38C	Main
MP-39A	North Olive
MP-39B	Rand
MP-39C	Main
MP-40A	A Clay
MP-40B	Main Silt (Rand Horizon)
MP-40C	Main
MP-41A	North Olive
MP-41B	Rand
MP-41C	Main
MP-42A	North Olive
MP-42B	Rand
MP-42C	Main
MP-43A	North Olive
MP-43B	Main Silt (Rand Horizon)
MP-43C	Main Silt (Rand Horizon) / Main Sand
MP-44A	A Clay
MP-44B	North Olive
MP-44C	Rand
MP-44D	Main
MP-45A	North Olive
MP-45B	Rand
MP-45C	Main
MP-46A	North Olive
MP-46B	Rand
MP-46C	Main
MP-47A	North Olive
MP-47B	Rand
MP-47C	Main
MP-48A	North Olive
MP-48B	Main Silt (Rand Horizon)
MP-48C	Main
MP-49A	A Clay
MP-49B	Rand
MP-49C	Main
MP-50A	A Clay
MP-50B	Rand
MP-50C	Main
MP-51A	A Clay
MP-51B	North Olive
MP-51C	Rand
MP-51D	Main
MP-52A	A Clay
MP-52B	Rand
MP-52C	Main
MP-53A	A Clay
MP-53B	Rand
MP-53C	Main
MP-54A	North Olive
MP-54B	Rand
MP-54C	Main
MP-55A	N. Olive / B Clay
MP-55B	Rand
MP-55C	Main
MP-56A	North Olive
MP-56B	Rand
MP-56C	Main

TABLE 1

List of Monitoring Wells Gauged on a Quarterly Basis

The Hartford Area Hydrocarbon Plume Site

1190505040 -- Madison County -- ILR 000128249

The Hartford Working Group / Hartford, IL

Well	Stratum Screened
MP-57A	North Olive
MP-57B	Rand
MP-57C	Main
MP-58A	A Clay
MP-58B	Main Silt (Rand Horizon)
MP-58C	Main
MP-59A	A Clay
MP-59B	Main Silt (Rand Horizon)
MP-59C	Main
MP-60A	A Clay
MP-60B	Main Silt (Rand Horizon)
MP-60C	Main
MP-61A	A Clay
MP-61B	Main Silt (Rand Horizon)
MP-61C	Main
MP-62A	A Clay
MP-62B	Main Silt (N. Olive Horizon)
MP-62C	Main
MP-63A	A Clay
MP-63B	Main Silt (N. Olive Horizon)
MP-63C	Main
MP-64A	A Clay
MP-64B	Main Silt (N. Olive Horizon)
MP-64C	Main
MP-65A	Main Silt (N. Olive Horizon)
MP-65B	Main
MP-65C	Main
MP-66A	Main Silt (N. Olive Horizon)
MP-66B	Main Silt (Rand Horizon)
MP-66C	Main
MP-67A	A Clay
MP-67B	Main Silt (Rand Horizon)
MP-67C	Main
MP-68	North Olive
MP-69	North Olive
MP-70	North Olive
MP-71	North Olive
MP-72	North Olive
MP-73	North Olive
MP-74	North Olive
MP-75	North Olive
MP-76	North Olive
MP-77A	A Clay
MP-77B	Main Silt (Rand Horizon)
MP-77C	Main
MP-78A	A Clay
MP-78B	North Olive
MP-78C	Rand
MP-78D	Main
MP-79A	North Olive
MP-79B	Rand
MP-79C	Main
MP-79D	Main
MP-80A	North Olive
MP-80B	Rand
MP-80C	Main
MP-81A	A Clay
MP-81B	Main Silt (Rand Horizon)
MP-81C	Main
MP-82A	A Clay
MP-82B	Main Silt (Rand Horizon)
MP-82C	Main
MP-83A	North Olive
MP-83B	Rand
MP-83C	Main
MP-84A	A Clay
MP-84B	Main Silt (Rand Horizon)
MP-84C	Main Silt (Rand Horizon) / Main Sand
MP-85A	North Olive
MP-85B	Rand
MP-85C	EPA
MP-85D	Main
MP-86A	A Clay
MP-86B	Main Silt (Rand Horizon)
MP-86C	Main

TABLE 1

List of Monitoring Wells Gauged on a Quarterly Basis

The Hartford Area Hydrocarbon Plume Site

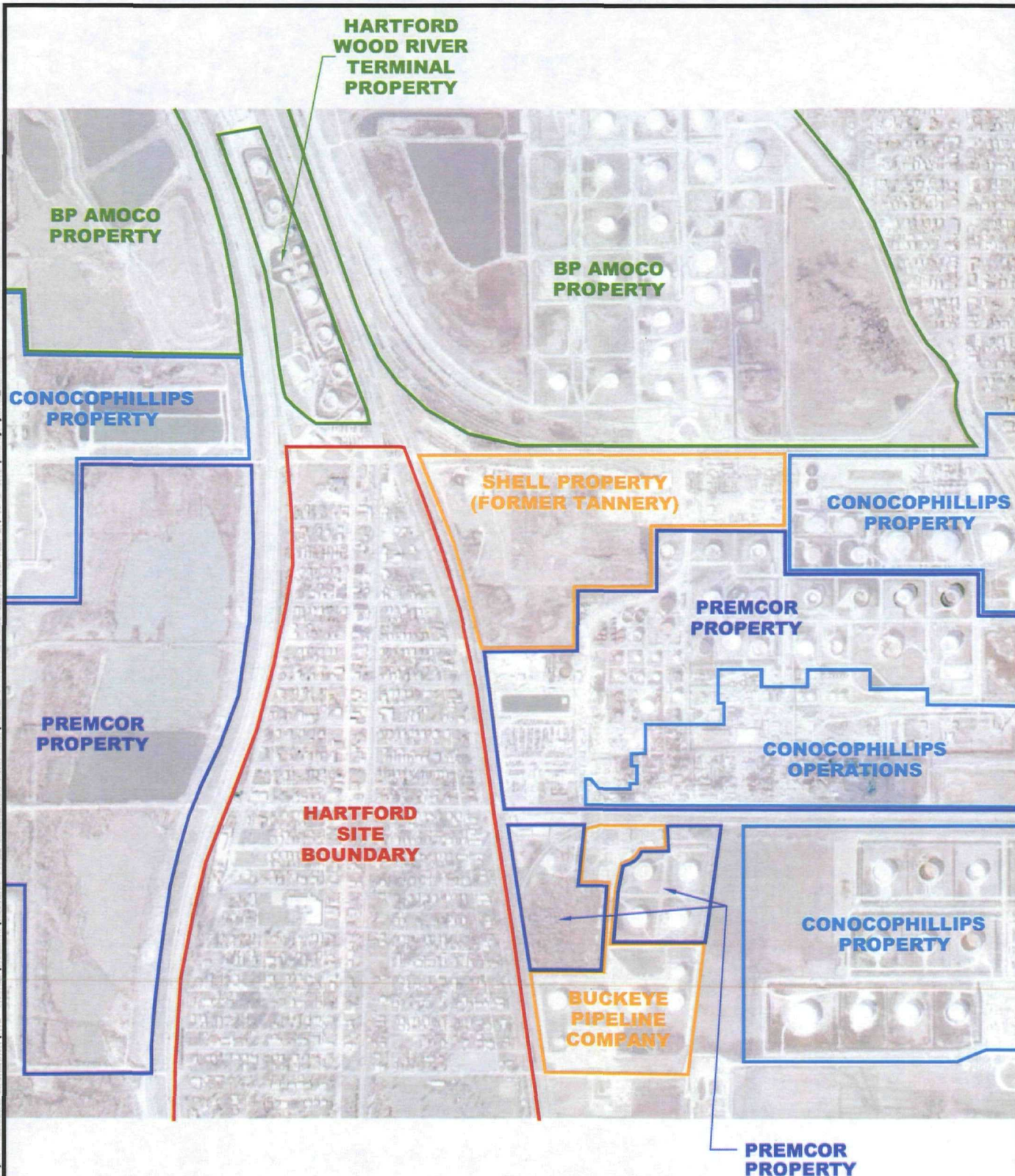
1190505040 -- Madison County -- ILR 000128249

The Hartford Working Group / Hartford, IL.

Well	Stratum Screened
MP-87A	A Clay
MP-87B	Main Silt (Rand Horizon)
MP-87C	Main
MP-88A	A Clay
MP-88B	Main Silt (Rand Horizon)
MP-88C	Main
MP-89A	A Clay
MP-89B	Main Silt (Rand Horizon)
MP-89C	Main
MP-90BR	Main Silt (N. Olive Horizon)
MP-90C	Main Silt (Rand Horizon) / Main Sand
MP-91B	Main Silt (N. Olive Horizon)
MP-91C	Main Silt (Rand Horizon)
MP-91D	Main
MP-92C	North Olive
MP-92D	Main Silt (Rand Horizon) / Main Sand
MP-93A	Fill / A Clay
MP-93B	A Clay
MP-94A	A Clay
MP-94B	Main Silt
MP-95A	A Clay
MP-95B	Main Silt
MP-96A	A Clay
MP-96B	North Olive
MP-96C	Rand
MP-96D	Main
MP-97A	A Clay
MP-97B	North Olive
MP-97C	Rand
MP-97D	Main
MP-98A	A Clay
MP-98B	North Olive
MP-98C	Rand
MP-99A	A Clay
MP-99B	Main Silt
MP-99C	Main
MP-100A	Fill
MP-100B	A Clay
MP-100C	Main Silt
MP-100D	Main
MP-101A	A Clay
MP-101B	Main Silt
MP-101C	Main
MP-102A	A Clay
MP-102B	Main Silt
MP-102C	Main
MP-103A	A Clay
MP-103B	Main Silt
MP-103C	Main
MP-104A	A Clay
MP-104B	Main Silt
MP-104C	Main
MP-105A	A Clay / N. Olive
MP-105B	A Clay / N. Olive
MP-105C	A Clay / N. Olive
MP-105D	A Clay / N. Olive
MP-105E	A Clay / N. Olive
MP-106A	A Clay
MP-106B	North Olive
MP-106C	Rand
MP-107A	A Clay
MP-107B	North Olive
MP-107C	Rand
MP-108A	A Clay
MP-108B	North Olive
MP-108C	Rand
RW-1	Main
RW-2	Main
RW-3	Main
RW-4	Rand / C Clay / Main Sand
RW-4A	Rand / C Clay / Main Sand
RW-5	Rand / C Clay / Main Sand



File: P:\ENVIRONMENTAL\HARTFORD WORKING GROUP\7.0 TECHNICAL INFORMATION\7.12 FIGURES\DRAWINGS\DISSOLVED PHASE INVESTIGATION WORK PLAN\FIGURE 01-AREA MAP.DWG Last edited: FEB. 27, 09 @ 3:15 p.m. by: lymetta_morthland



****NOT TO SCALE****

NOTE:
 PROPERTY BOUNDARIES ARE GENERALIZED.
 MAP CREATED FROM BASEMAP PROVIDED BY BVNA.

HARTFORD WORKING GROUP PLUME SITE
 DISSOLVED PHASE INVESTIGATION WORK PLAN
 HARTFORD, IL

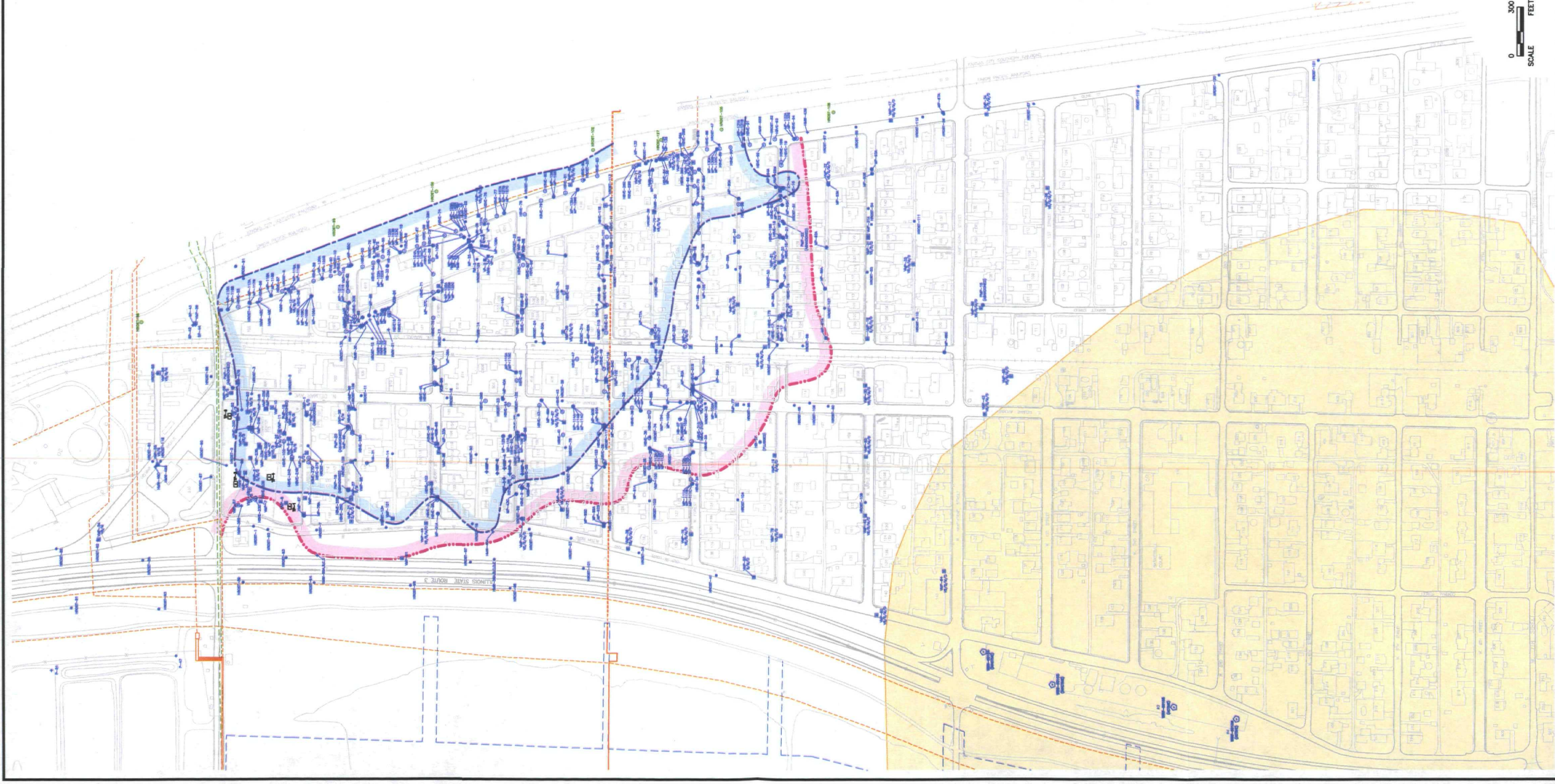
PROJECT NO.
 21562129

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DRN. BY: lrm 2/10/09
 DSGN. BY: bh
 CHKD. BY:

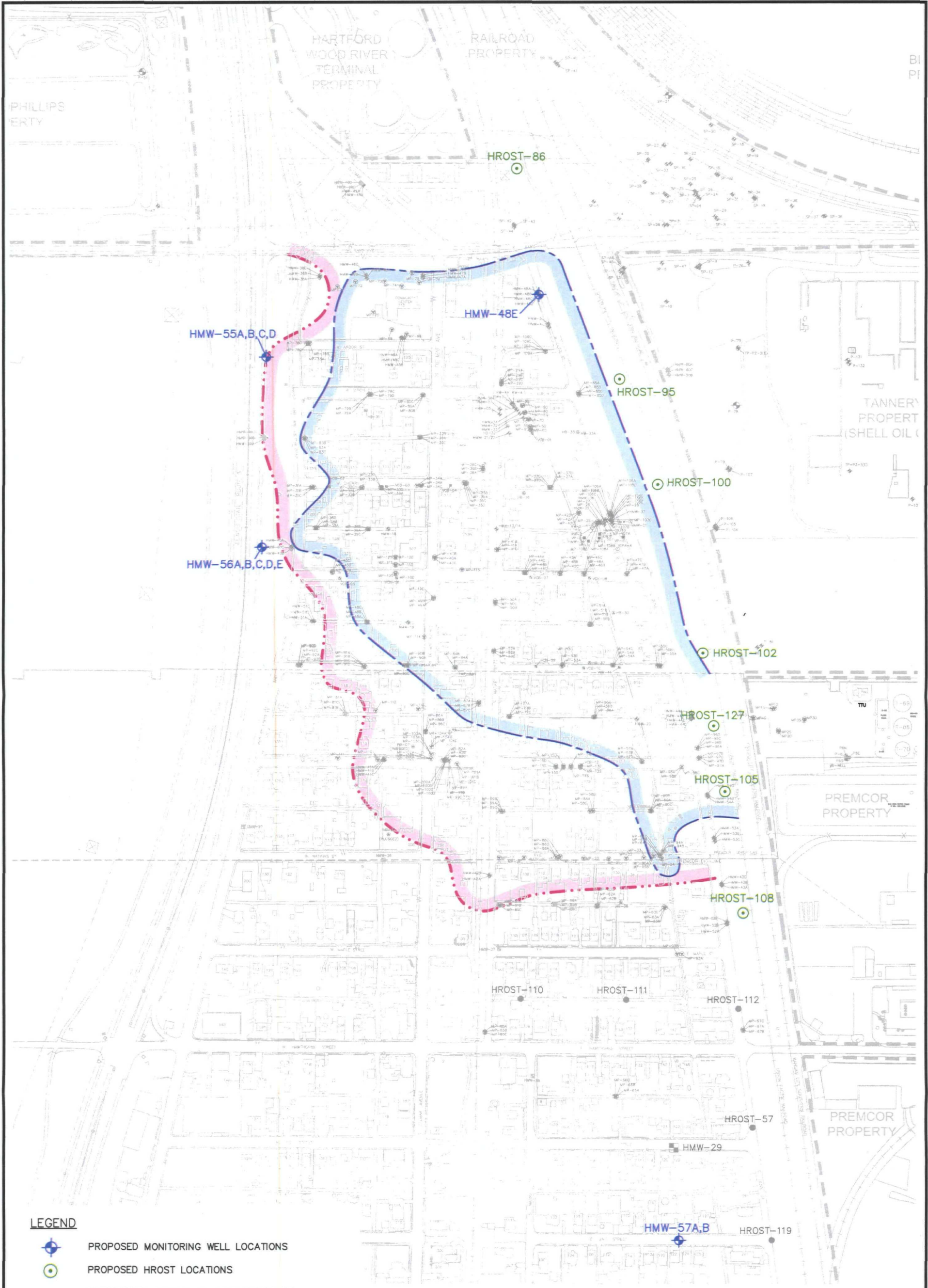
VILLAGE OF HARTFORD, IL AND
 SURROUNDING AREA MAP

FIG. NO.
 1



NOTE: MAP CREATED FROM BASEMAP PROVIDED BY BVA.	PROJECT NO. 21502128
HARTFORD WORKING GROUP PLUME SITE DISSOLVED PHASE INVESTIGATION WORK PLAN HARTFORD, CT	

DATE: 2/10/09 DRAWN BY: [Signature]	FIG. NO. 2
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LEGEND

- PROPOSED MONITORING WELL LOCATIONS
- PROPOSED HROST LOCATIONS
- INTERPRETED EXTENT OF ROST RESPONSE (ALL STRATA)
- INTERPRETED EXTENT OF FREE PRODUCT OBSERVED IN MONITORING WELLS (ALL STRATA)

NOTE:
1. RESULTS FOR ALL CONSTITUENTS IN ug/L.
2. MAP CREATED FROM BASEMAP PROVIDED BY BVNA.



HARTFORD WORKING GROUP PLUME SITE DISSOLVED PHASE INVESTIGATION WORK PLAN HARTFORD, IL	PROJECT NO. 21562129
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DRN. BY:irm 2/10/09 DSGN. BY:bh CHKD. BY:	Proposed Locations	FIG. NO. 3
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